



Gates, Series 54/74

DM5402/DM7402

DM5402/DM7402 (SN5402/SN7402) quad two-input NOR gate

general description

The DM5402/DM7402 is a quad 2-input NOR gate utilizing TTL (Transistor-Transistor Logic) to achieve high speed at nominal power dissipation. It is completely compatible with other Series 54/74 devices.

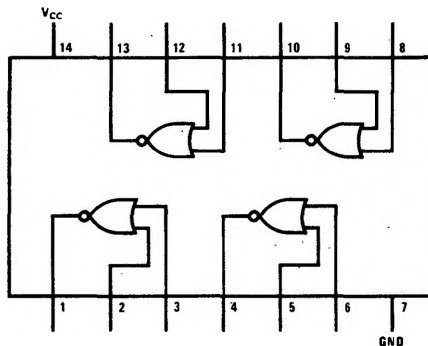
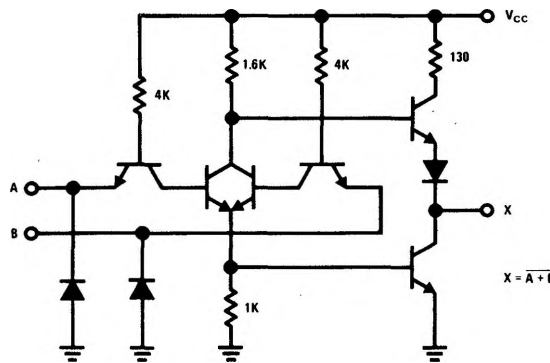
Features include:

- Input Clamping Diodes
- Typical Noise Immunity 1V
- Guaranteed Noise Immunity 400 mV
- Fan-out 10
- Allowable Power Supply Variation

DM5402	4.5V to 5.5V
DM7402	4.75V to 5.25V
- Average Propagation Delay 12 ns (with 50 pF)
- Average Power Dissipation 14 mW per gate

schematic and connection diagrams

DM5402/DM7402 (each gate)



absolute maximum ratings

V_{CC}	7V
Input Voltage	5.5V
Operating Temperature Range	
DM7402	0°C to 70°C
DM5402	-55°C to +125°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10 sec)	300°C

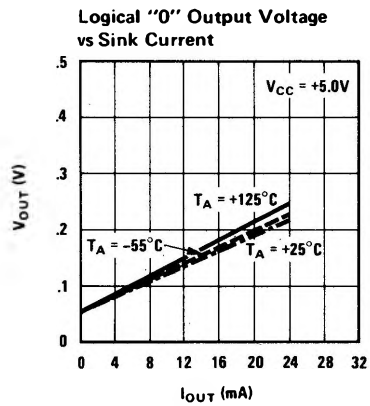
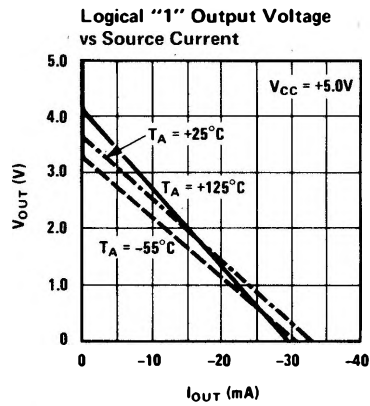
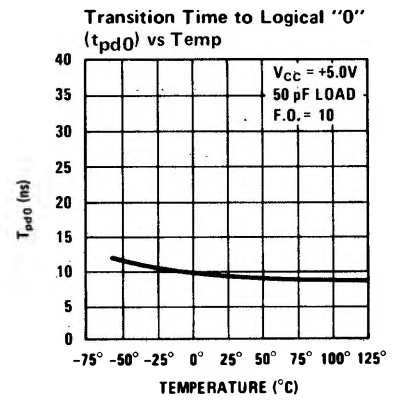
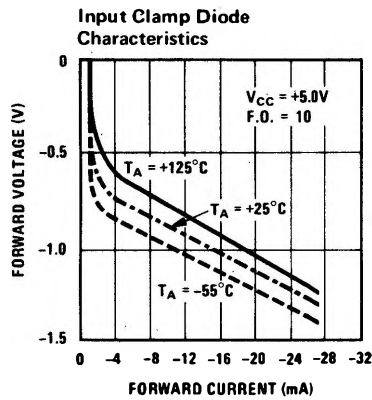
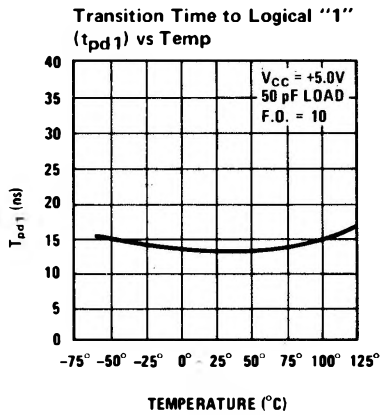
electrical characteristics (Note 1)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
Input Diode Clamp Voltage	$V_{CC} = 5.0V$ $T_A = 25^\circ C$ $I_{IN} = -12 mA$			-1.0	-1.5	V
Logical "1" Input Voltage	DM5402	$V_{CC} = 4.5V$	2.0			V
	DM7402	$V_{CC} = 4.75V$				
Logical "0" Input Voltage	DM5402	$V_{CC} = 4.5V$			0.8	V
	DM7402	$V_{CC} = 4.75V$				
Logical "1" Output Voltage	DM5402	$V_{CC} = 4.5V$	2.4			V
	DM7402	$V_{CC} = 4.75V$		$V_{IN} = 0.8V, I_{OUT} = -400 \mu A$		
Logical "0" Output Voltage	DM5402	$V_{CC} = 4.5V$			0.4	V
	DM7402	$V_{CC} = 4.75V$	$V_{IN} = 2.0V, I_{OUT} = 16 mA$			
Logical "1" Input Current	DM5402	$V_{CC} = 5.5V$			40	μA
	DM7402	$V_{CC} = 5.25V$		$V_{IN} = 2.4V$		
Logical "1" Input Current	DM5402	$V_{CC} = 5.5V$			1	mA
	DM7402	$V_{CC} = 5.25V$		$V_{IN} = 5.5V$		
Logical "0" Input Current	DM5402	$V_{CC} = 5.5V$			-1.0	mA
	DM7402	$V_{CC} = 5.25V$		$V_{IN} = 0.4V$		
Output Short Circuit Current (Note 2)	DM5402	$V_{CC} = 5.5V$	-20	-32	-55	mA
	DM7402	$V_{CC} = 5.25V$				
Supply Current-Logical "0" (each gate)	DM5402	$V_{CC} = 5.5V$		3.6	6.3	mA
	DM7402	$V_{CC} = 5.25V$				
Supply Current-Logical "1" (each gate)	DM5402	$V_{CC} = 5.5V$		2.0	3.6	mA
	DM7402	$V_{CC} = 5.25V$				
Propagation Delay to a Logical "0", t_{pd0}		$V_{CC} = 5.0V$ $T_A = 25^\circ C$ $C = 50 pF$	3	9	15	ns
Propagation Delay to a Logical "1", t_{pd1}		$V_{CC} = 5.0V$ $T_A = 25^\circ C$ $C = 50 pF$	5	13	22	ns

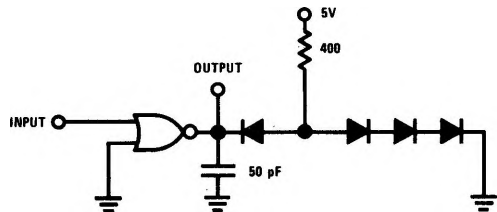
Note 1: Min/max limits apply across the guaranteed temperature range of 0°C to 70°C for the DM7402 and -55°C to +125°C for the DM5402 unless otherwise specified. All typicals are given for $V_{CC} = 5.0V$ and $T_A = 25^\circ C$.

Note 2: Only one output at a time should be short circuited.

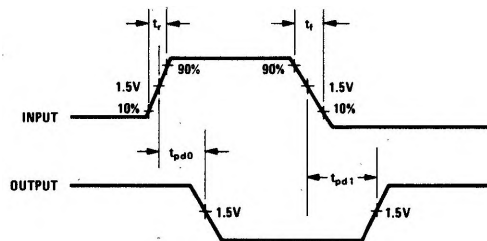
typical performance characteristics



ac test circuit



switching time waveform



$t_r = t_f = 10$ ns
pw = 100 ns
frequency = 1 MHz
 $V_{CC} = 5.0V$